Growing & Planting Underwater Bay Grasses

Presentation developed by Jill Bieri, and modified by Peter Bergstrom, NOAA, for 2005 "NOAA Restoring the Bay Day"

What are Underwater Grasses?

- Rooted, flowering plants; produce seeds
- Grow completely submerged in shallow water of Bay and tributaries
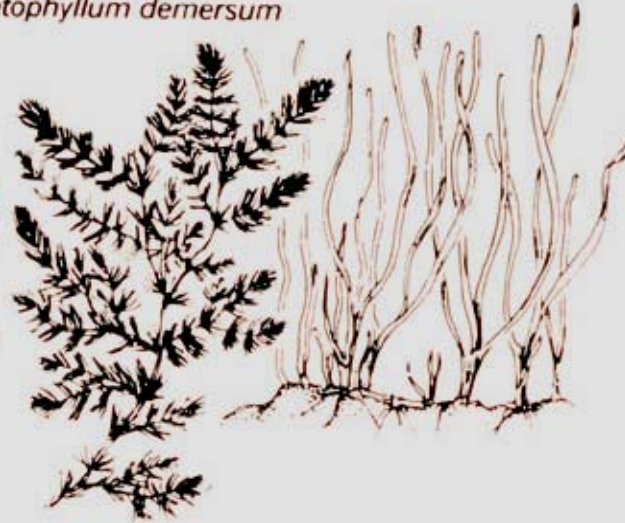- A.K.A.: SAV, seagrass
- NOT: seaweed, algae

HORNED PONDWEED
Zannichellia palustris

WIDGEON GRASS
Ruppia moritima

COONTAIL
Ceratophyllum demersum

EELGRASS
Zostera marina

WILD CELERY
Vallisneria americana

SAGO PONDWEED
Potamageton pectinatus

EURASIAN WATERMILFOIL
Myriophyllum spicatum

REDHEAD GRASS
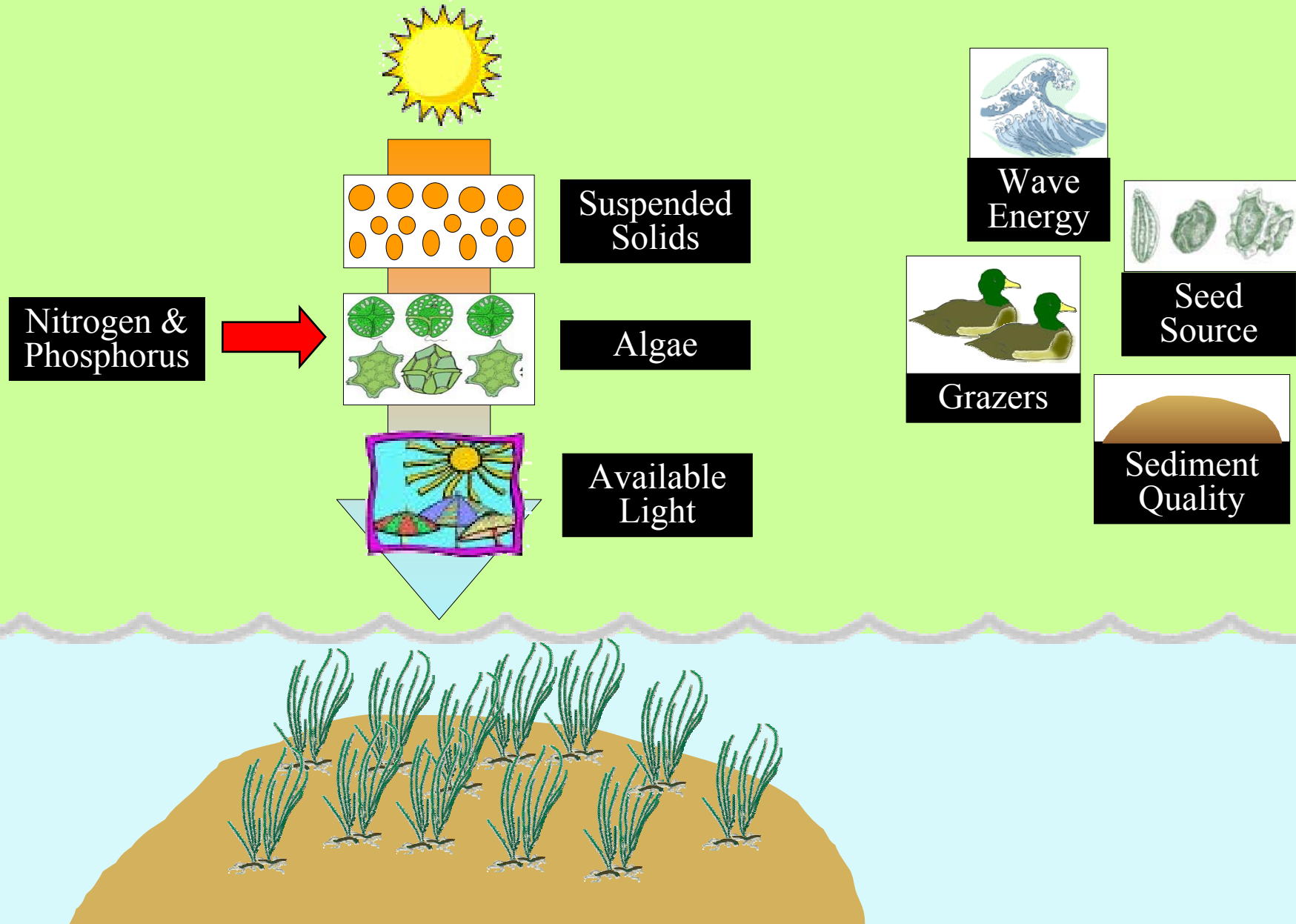*Potamageton perfoliatus*

WATERWEED
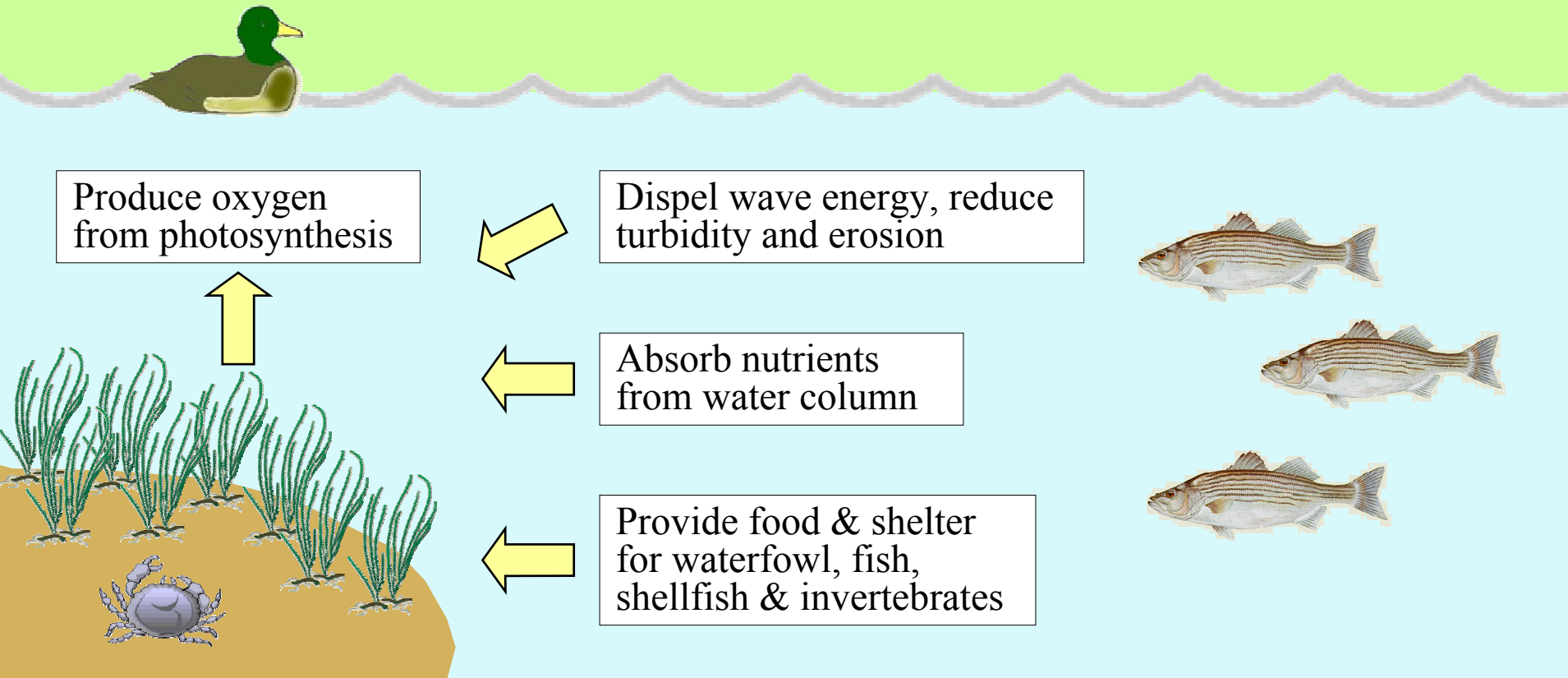*Elodea canadensis*

.BUSHY PONDWEED
Naja guadalupensis

SEAGRASSES of Chesapeake Bay

Elaine Kasmer

What Affects SAV?

Suspended Solids

Nitrogen & Phosphorus

Algae

Available Light

Wave Energy

Seed Source

Grazers

Sediment Quality

SAV: Ecological Role

Produce oxygen from photosynthesis

Dispel wave energy, reduce turbidity and erosion

Absorb nutrients from water column

Provide food & shelter for waterfowl, fish, shellfish & invertebrates
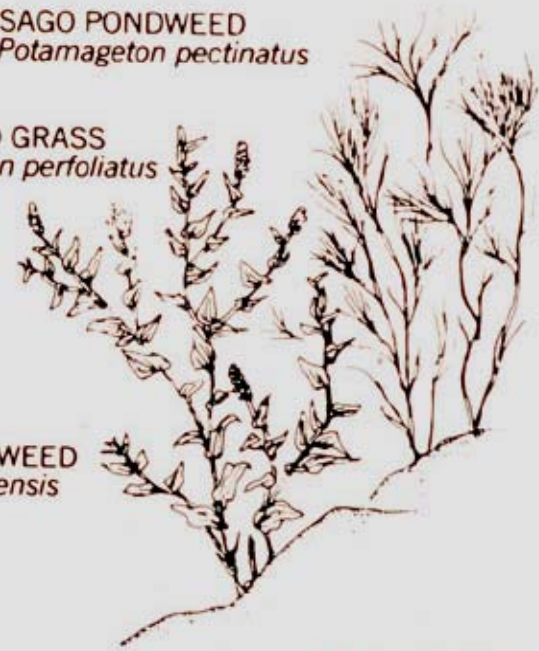
Underwater Grasses Help Clean the Bay!

Juvenile Crab Density

crabs per sq. meter

- 30 — areas with underwater grasses
- 1 — areas without underwater grasses
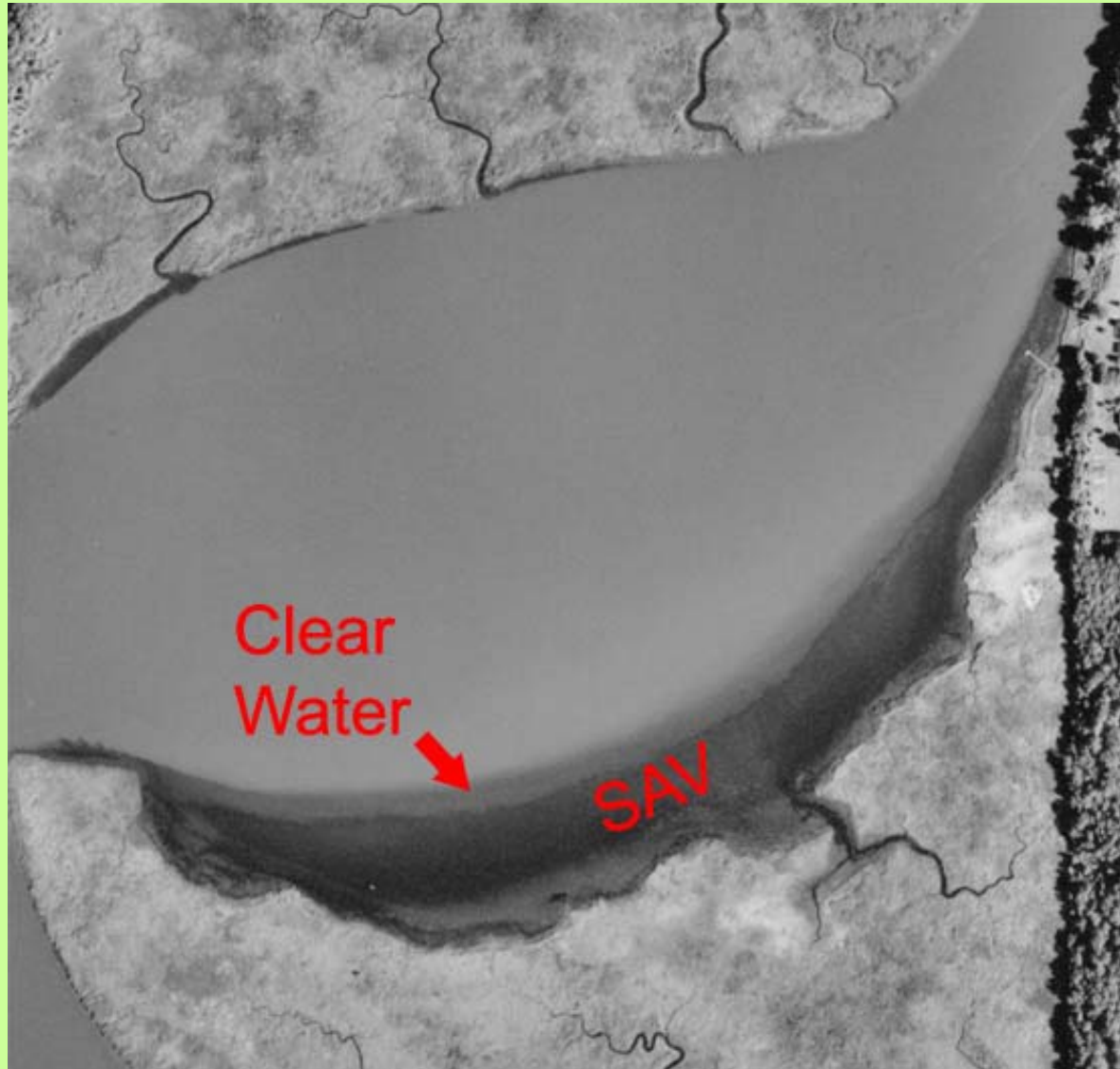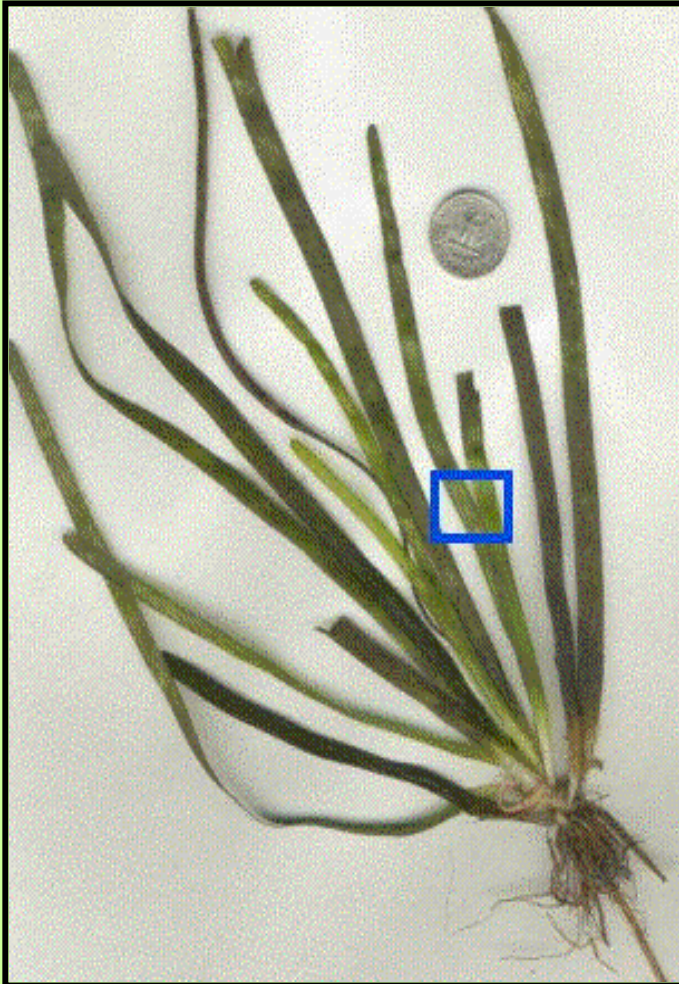
Are blue crab populations and underwater grass abundance related?
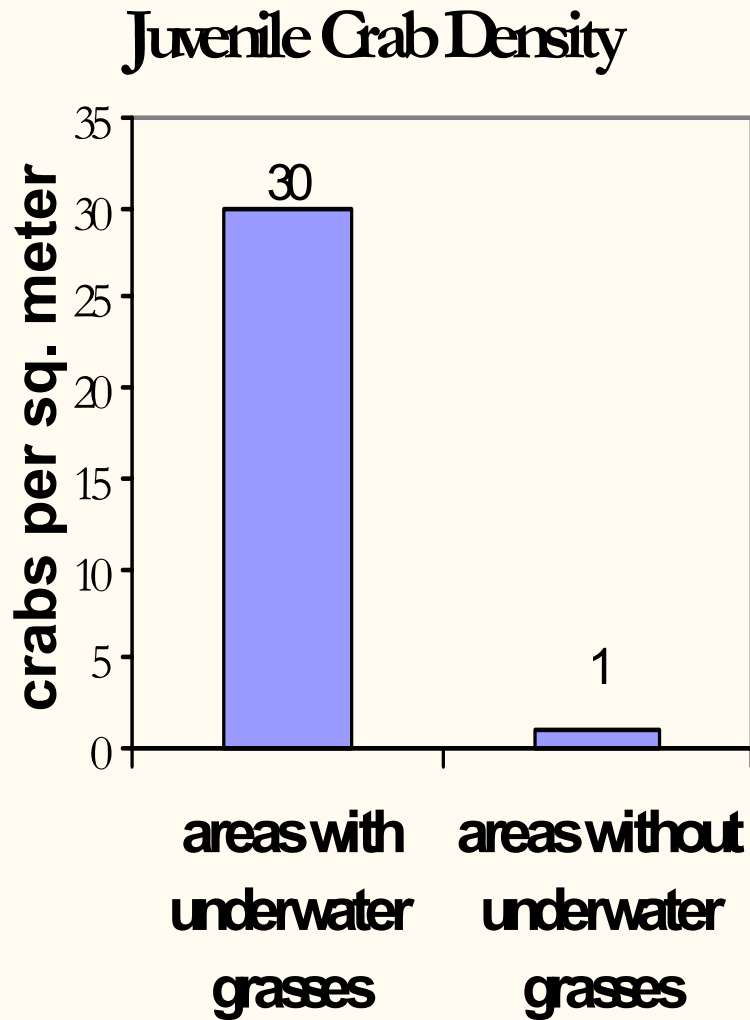
Wild Celery (*Vallisneria americana*)

- **long, flat ribbon-like leaves**
- **Found primarily in fresh to slightly brackish water (5 ppt or less)**
  - *Thus, water at Webster Field is too salty for it, will NOT grow this year*
- **excellent waterfowl food**

Redhead Grass (*Potamogeton perfoliatus*)

- **straight stems and rounded leaves**
- **found in moderately brackish water (5-15 ppt)**
  - *Could grow at Webster, so we will grow it this year*
- **named for redhead duck**
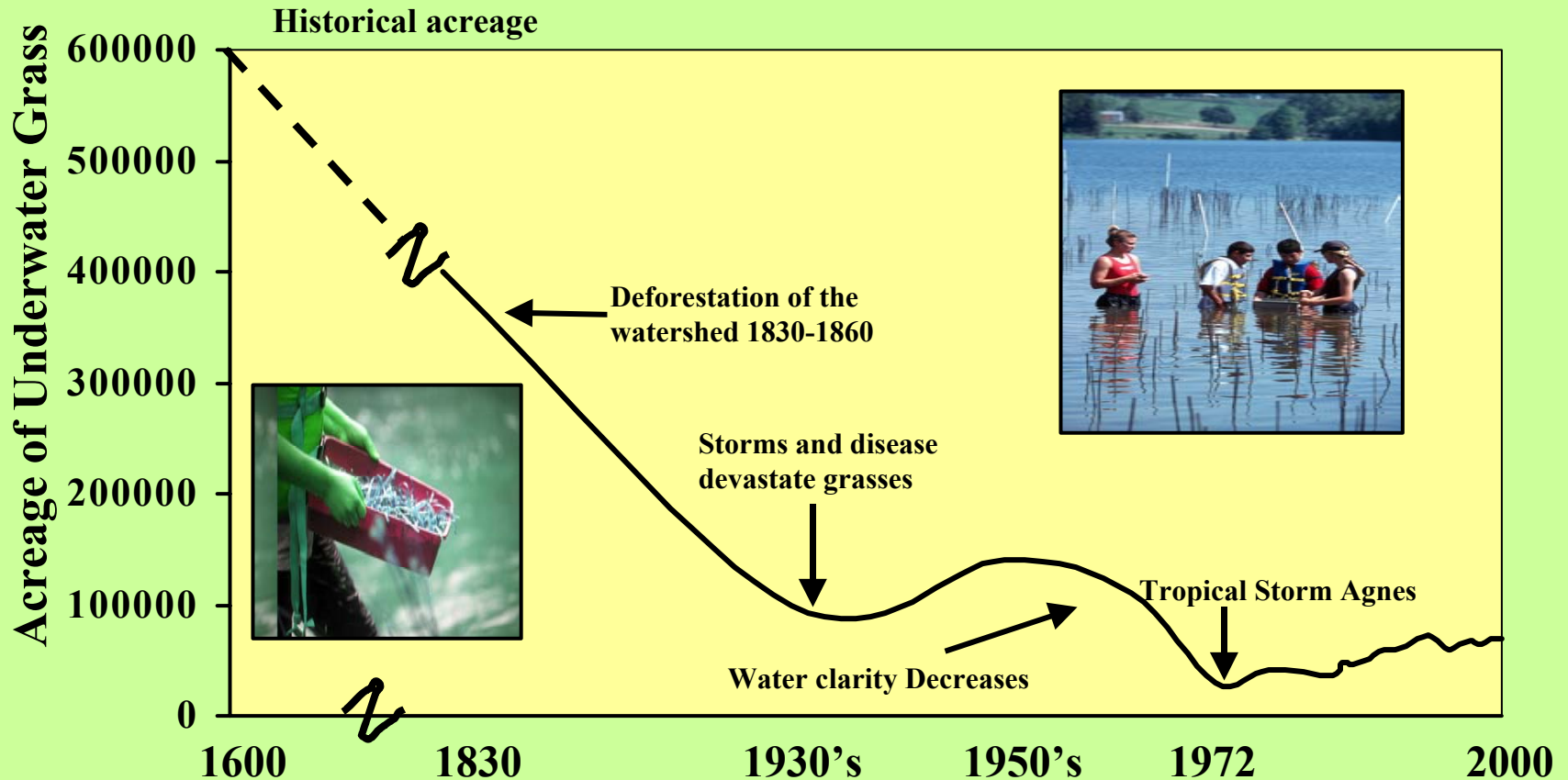- **excellent waterfowl food**
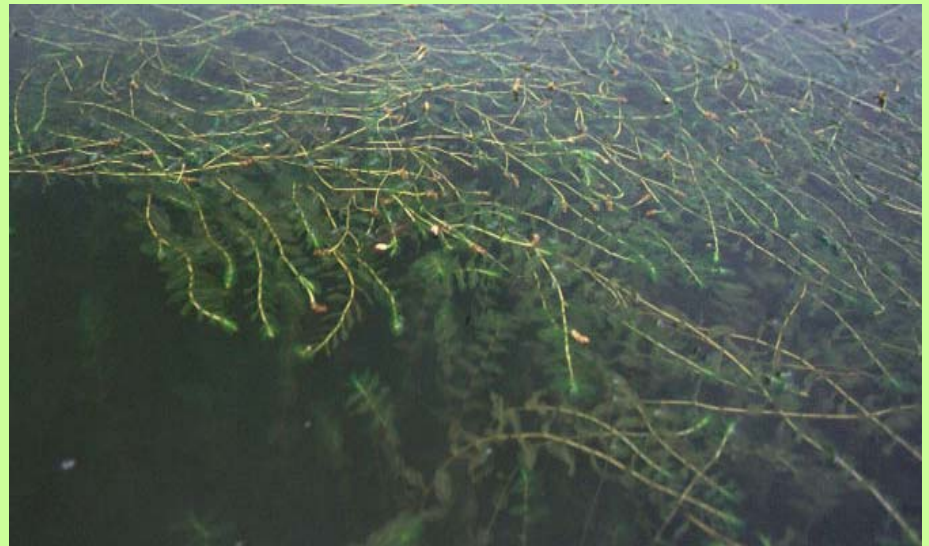
Sago pondweed (*Stuckenia pectinata*)

- **Thin, bushy leaves with terminal seed clusters**
- **found in moderately brackish water (5-25 ppt)**
  - *Grows well near Webster, so we will grow it this year*
- **excellent waterfowl food**
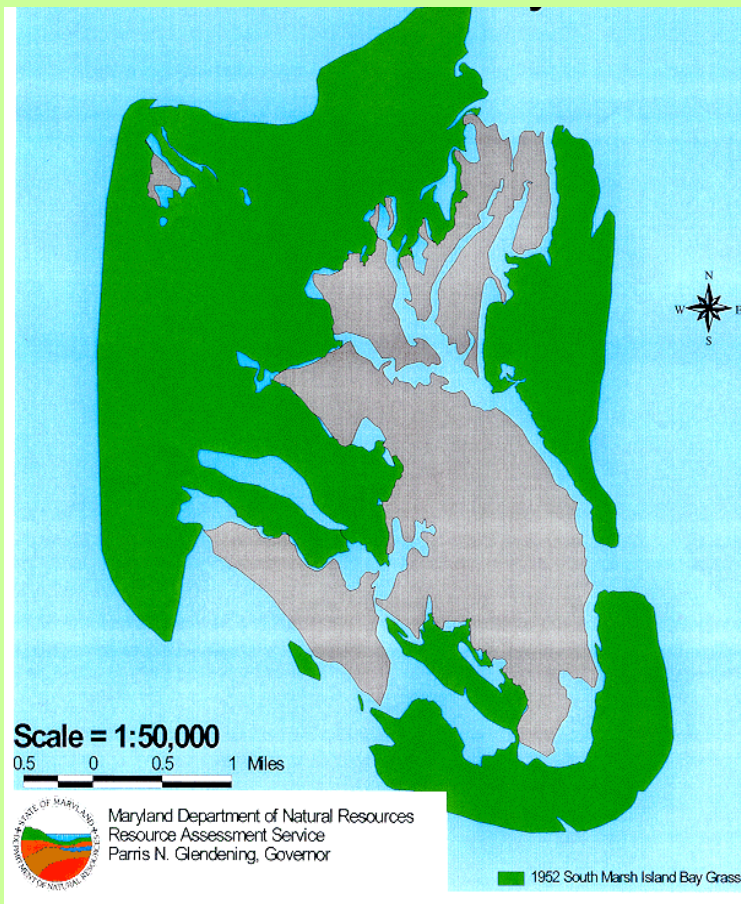
Decline of Underwater Grasses

Chesapeake Bay has only 12% of historical acreage of underwater grasses. Poor water quality caused by nutrient and sediment pollution is the culprit.
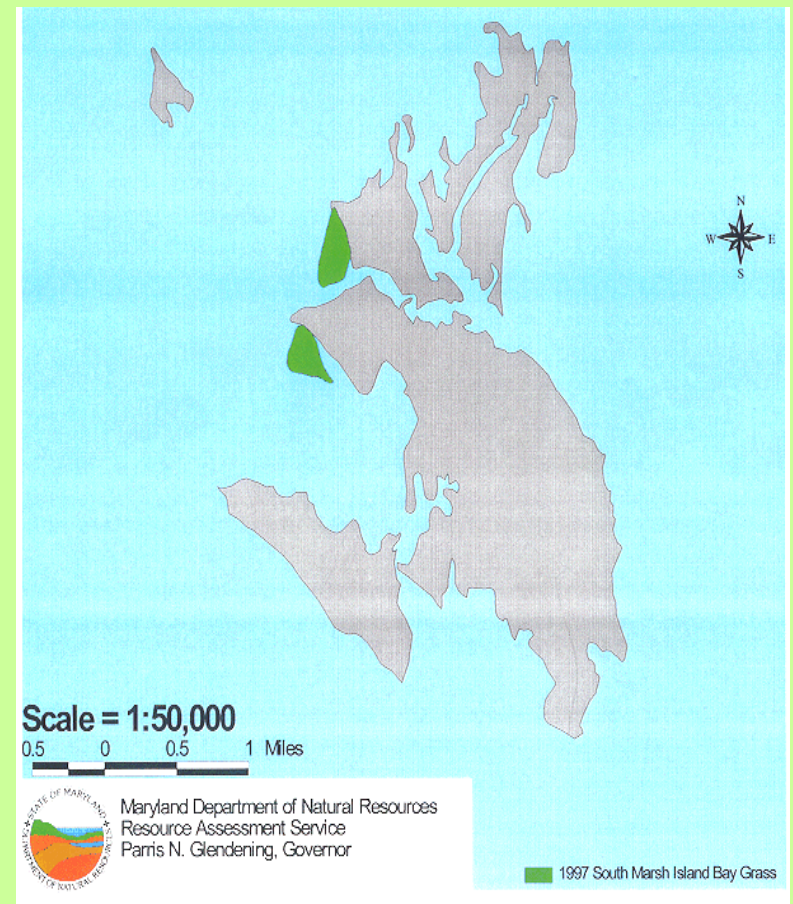
Source: CBF (abundances estimated)
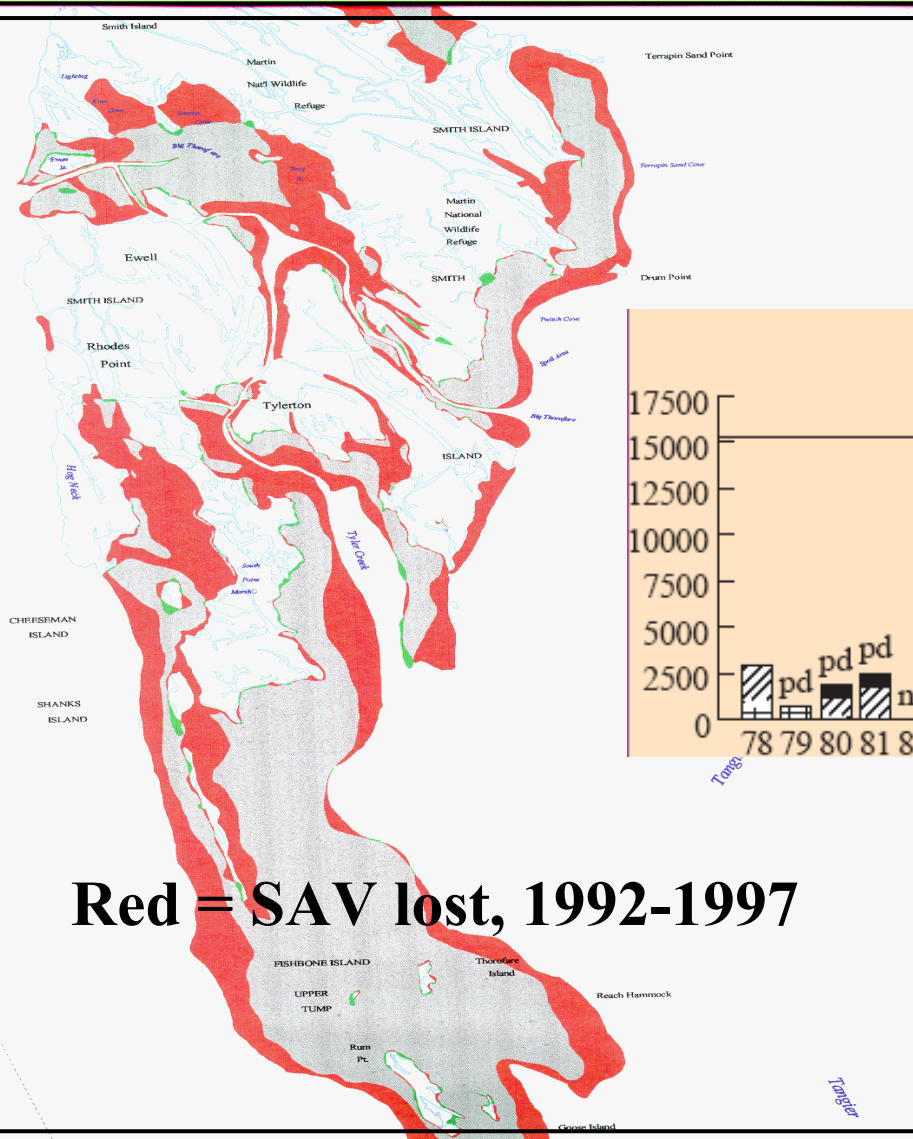
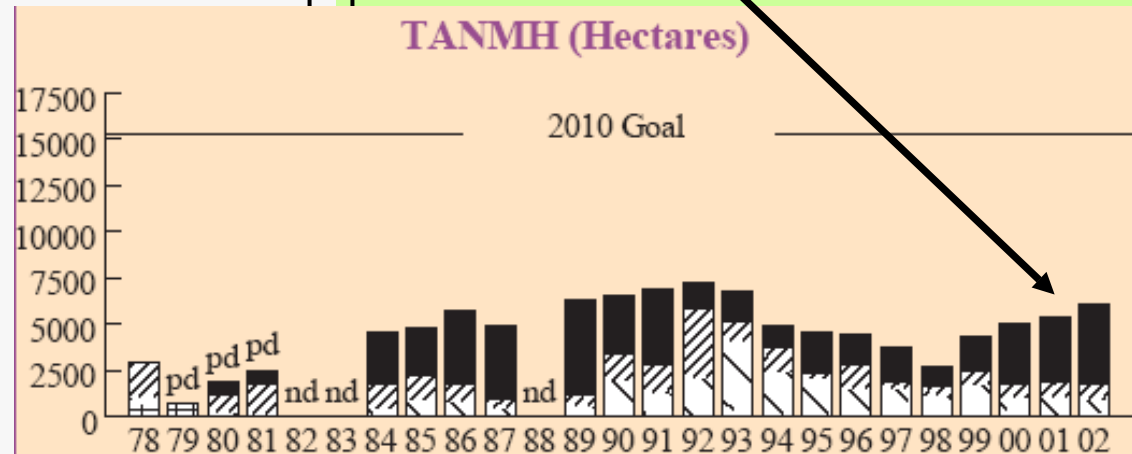# Decline of South Marsh Island Underwater Grasses

1952

1997

Scale = 1:50,000
0.5   0   0.5   1 Miles

Maryland Department of Natural Resources
Resource Assessment Service
Parris N. Glendening, Governor

1952 South Marsh Island Bay Grass

Scale = 1:50,000
0.5   0   0.5   1 Miles

Maryland Department of Natural Resources
Resource Assessment Service
Parris N. Glendening, Governor

1997 South Marsh Island Bay Grass

Smith and Tangier Island:
Rise, fall, recovery of SAV

Red = SAV lost, 1992-1997

Rise & fall of SAV--Dundee Creek
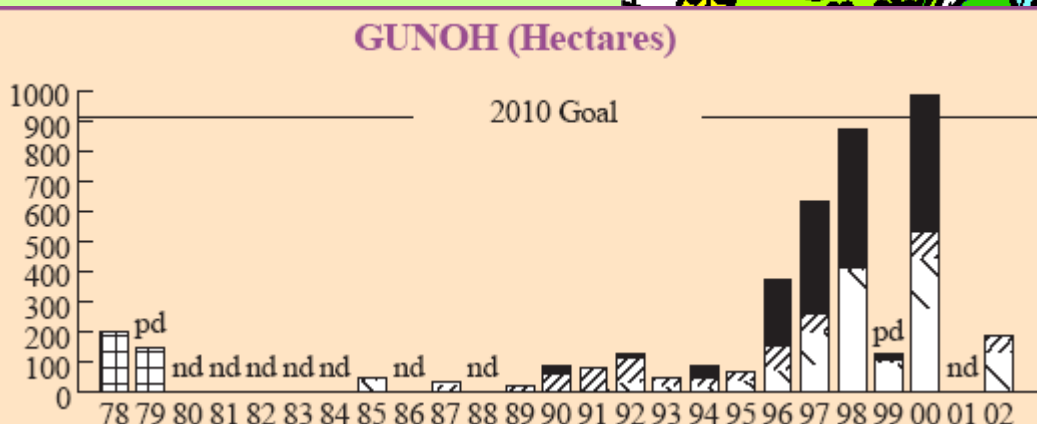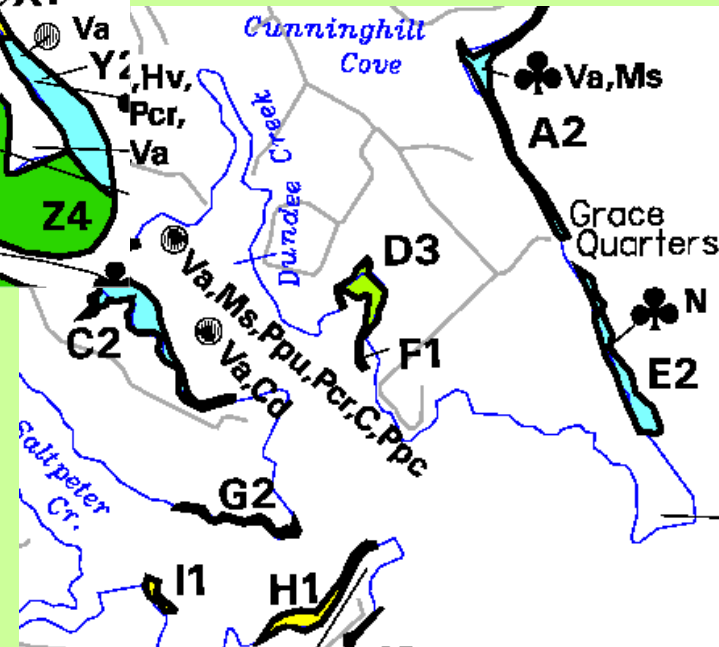
Rise & fall of SAV: Conclusions

- **SAV abundance is dynamic in Chesapeake Bay**

- **Causes of its rise and fall are not always clear**

- *Thus, to ensure persistence, we need a variety of species growing in numerous locations*

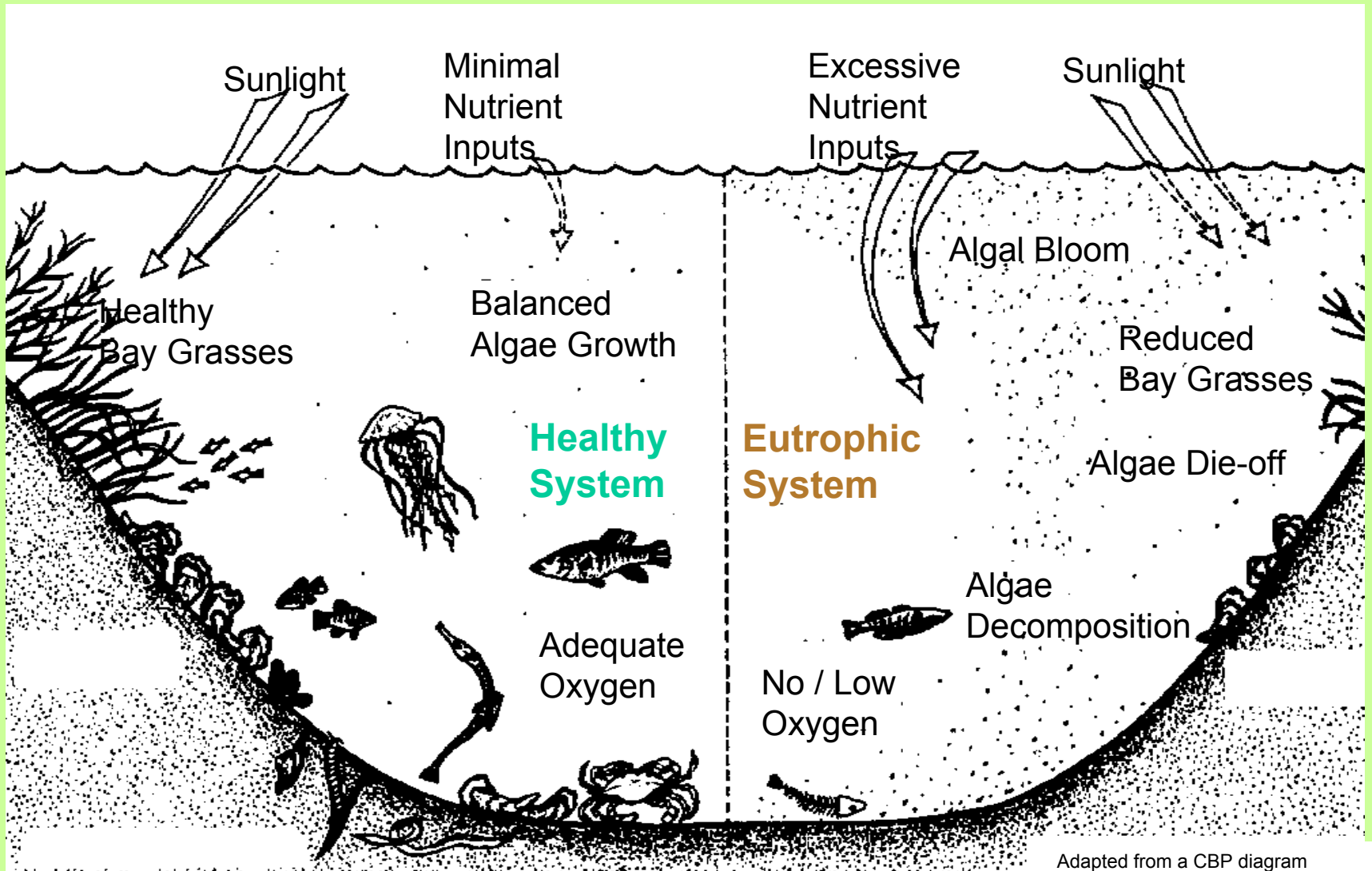- **Planting SAV helps to accomplish persistence**

Goal: 185,000 acres by 2010

Accomplished by:

- **Improving Water Quality** (reducing inputs of nitrogen and sediment)

- **Protecting Existing Beds** (education, dredging issues, mute swan control)

- **Restoring grass beds** (establish founder populations)

Which Bay do we want?

Sunlight — Minimal Nutrient Inputs — Excessive Nutrient Inputs — Sunlight

Healthy Bay Grasses

Balanced Algae Growth

Healthy System

Adequate Oxygen

Eutrophic System

Algal Bloom

Reduced Bay Grasses

Algae Die-off

Algae Decomposition

No / Low Oxygen

Adapted from a CBP diagram

Restoration Site Selection

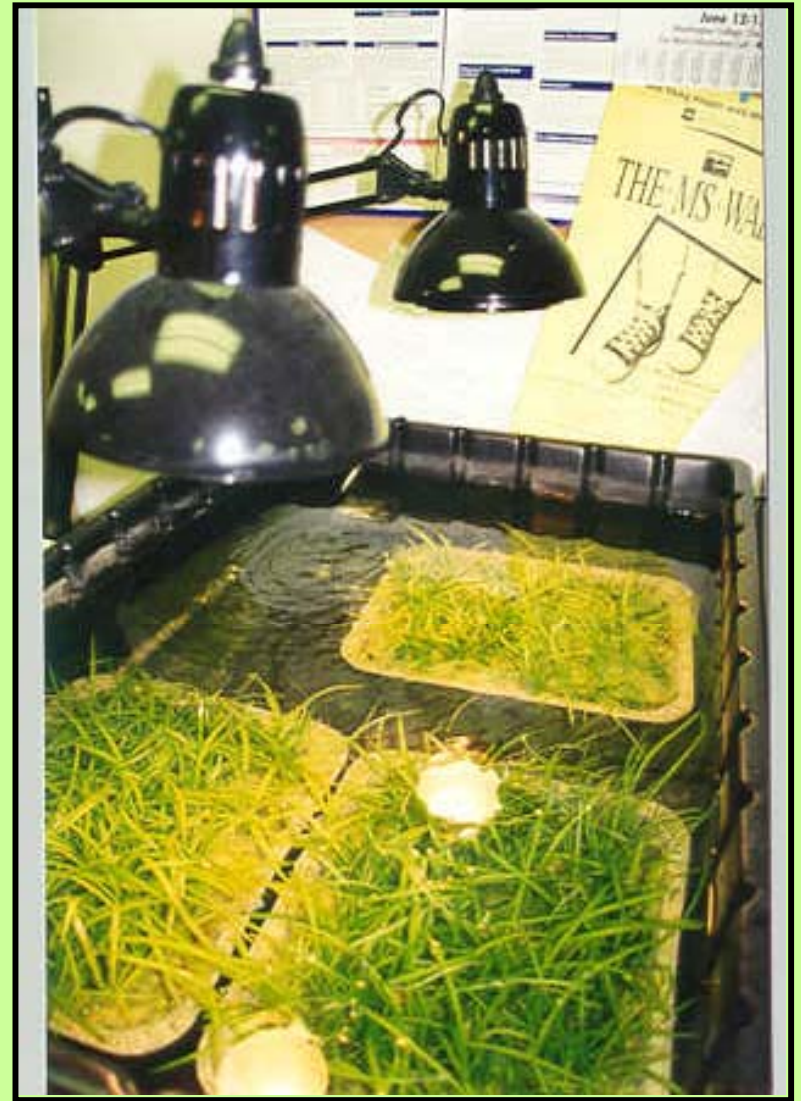- **Water Quality**
- **Historical Abundance**
- **Presence of grass in adjacent areas (species diversity)**
- **Substrate**
- **Accessibility**

NOAA Grasses Timeline 2005

- March 24: Workshop; Plant in systems

- March-June: Grow-out

- June 14: Plant at Webster Field

- June-October: Monitoring

Planting day 2004

NOAA Grasses Results 2004

- **Percent cover at planting was about 50% (25% each species)**

- **Monitoring was difficult due to turbid water when we went there**

- **CBEC staff checked them on a clear-water day, 9/26/04**

- *Redhead had expanded from 25% to 65% of the fenced area, but sago pondweed had shrunk to only 5% cover*
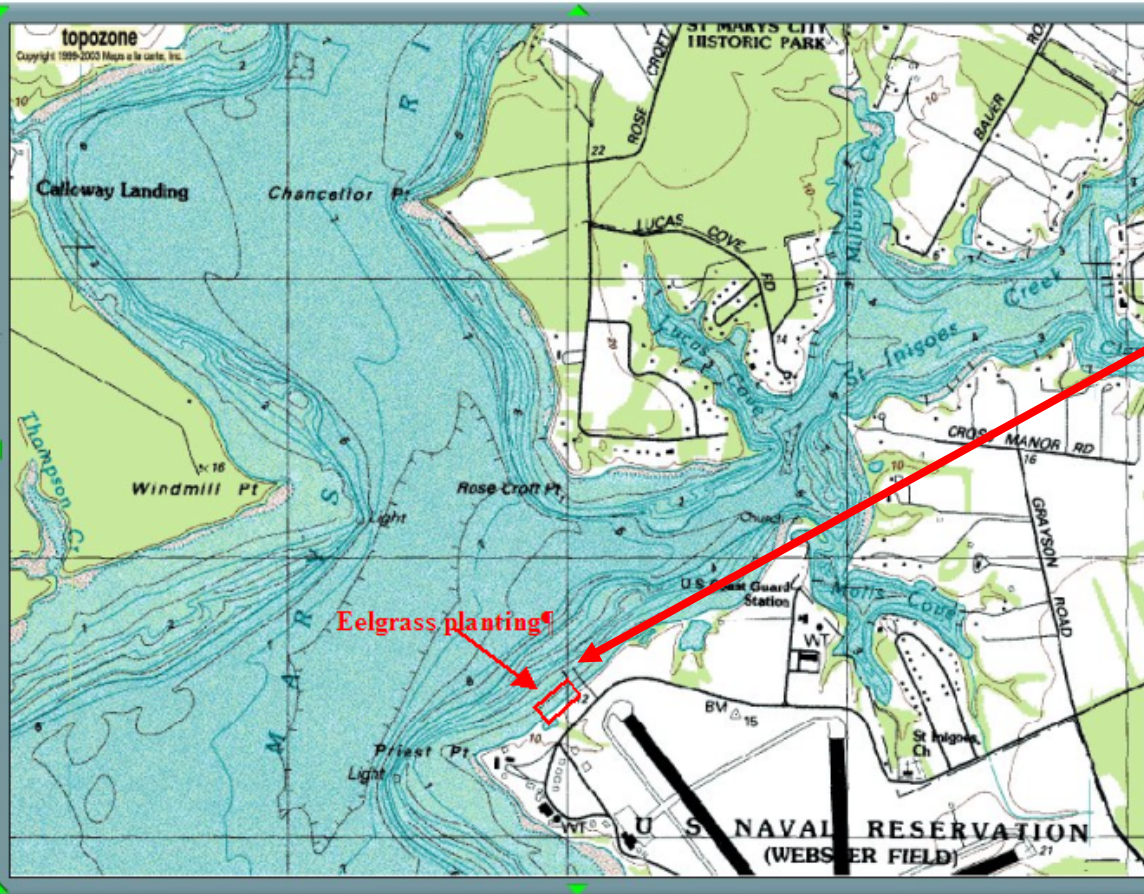
- **Not sure why sago did poorly**

Redhead a week after planting

2005 Planting location—Webster Field, St. Mary's River, Tues. June 14

We will plant redhead & sago next to the eelgrass, next to restored shoreline.

Sago has grown well in lower Potomac, redhead has not been tested there

Webster Field

restored shoreline

SAV Success!